



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------|------------------|
| 10/708,265 | 02/20/2004 | Yoji Maeda | JP920020215US1 | 2264 |
| 24241 | 7590 | 11/16/2006 | EXAMINER | |
| IBM MICROELECTRONICS INTELLECTUAL PROPERTY LAW 1000 RIVER STREET 972 E ESSEX JUNCTION, VT 05452 | | | ELVE, MARIA ALEXANDRA | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1725 | |

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

C

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/708,265 | MAEDA ET AL. | |
| | Examiner | Art Unit | |
| | M. Alexandra Elve | 1725 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>9/11/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Steur et al. (USPN 6,649,864) in view of Schultz et al. (USPAP 2002/0096501).

De Steur et al. discloses laser drilling of holes in a circuit board substrate. A perforated mask is used to drill a hole with a predetermined diameter. During drilling the laser beam is moved in a circular path (wobble motion). (abstract, figures, col. 1-3)

De Steur et al. does not teach the angle of the wobble motion.

Schultz et al. discloses the piercing using a laser. The laser beam is focused at an incident angle (0 to 10°). This may vary depending on the geometry and character of the material being processed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to determine the angle of the beam relative to the axis, as taught by Schultz et al. in the De Steur et al. process because this is merely a measurement of the operational parameters and ensures the formation of a quality drilled product.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (USPAP 2004/0222197 A1).

Hiramatsu discloses a laser system for forming via holes in a substrate. A CO₂ laser oscillator generates a laser beam, which is, passes through a condenser lens (92), a collimator lens (90) and a transfer mask (62). The beam is then positioned by galvano-mirrors (74X & 74Y), which are connected to angle adjustment motors (72X & 72Y) and finally passed through an f-theta lens (76) before impinging on the substrate. The substrate is mounted on a X-Y table (80), which may be moved relative to the laser head. Additionally, the system has a target mask (211), which may be placed on the substrate. The mask may be used to alter the diameter of the laser beam. (abstract, figures, 0027, 0043, 0056, 0060, 0062, 0066, 0068, 0095, 0111, 0112, 0133-0139, 0142, 0144-0145, 0153-0163, 0178-0181, 0187, 0197, 0207-0210, 0220, 0223, 0227-0228)

The f-theta lens is not a true condenser lens, although it is known for linearity effects. Substitution of known equivalent structures, in this case, an f-theta lens for a condensing lens is well known in the art. In re Ruff 118 USPQ 343 (CCPA 1959). In addition, the use of a condenser lens (92) is taught and is present in the apparatus set up. The reversal of parts was held to have been obvious. In re Gazda 104 USPQ 400. The rearrangement of parts was held to have been obvious. In re Japikse 86 USPQ 70.

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

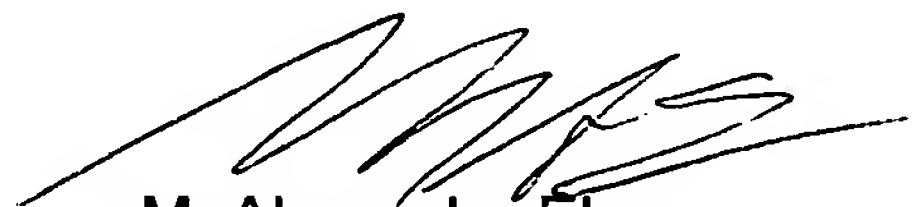
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See US PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 13, 2006.


M. Alexandra Elve
Primary Examiner 1725